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ABSTRACT

Research and clinical workers in the field of applied behavior analysis appear wedded to the re-education model of child behavior change. A review of the empirical literature strongly suggests that this model is inadequate in a number of respects. In response to these inadequacies, the authors propose an expansion of the model -- an expansion referred to as a social systems approach. This approach is a measurement effort to reach beyond the dyadic view constraining the re-education model. Some practical derivatives of such an alternative are presented and the specific steps to implement a social systems approach are outlined. (Author)

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SOCIAL SYSTEMS ANALYSIS: IMPLEMENTING AN ALTERNATIVE BEHAVIORAL MODEL[1,2]

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In helping troubled children, the prevalent method of behavioral technology is based on what might be termed the "re-education" model. This model assumes that a reprogramming of stimulus contingencies in social environments can be accomplished, behavior consequently can be changed, and these changes can be maintained by equipping the people who live in these environments with the tools of operant psychology. Since the classic statement of Bijou and Baer (1961), this notion has been the bedrock model of the field. As a therapeutic technique, it has enjoyed a seductive success and its underlying suppositions form the foundation of motivation behind the efforts of clinicians and researchers in applied behavior analysis. When aimed at troubled children, the re-education assumptions include:

1. The use of caretakers as therapeutic agents.
2. The therapeutic intervention is designed for the natural setting of the child.
3. The caretakers are trained in the technology of operant conditioning.
   a. These operant techniques are to be used to solve present-day problems.
   b. These operant techniques are also to be retained by the caretakers for use in the event of future problems.

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[2]This paper summarizes a presentation to a conference entitled Ecological Perspectives in Behavior Analysis. The conference was sponsored and hosted by the Department of Human Development, University of Kansas, Lawrence, Kansas, October, 1976.

4. The behavior change will be maintained by positive reinforcement processes (i.e., that the caretakers and the client will be so pleased with all the positive reinforcement they receive for their new behavior that they will continue such behavior). In general, the assumption of the re-education model is that the professional helper (e.g. psychologist, social worker, etc.) can give the tools of behavior change to the caretakers of the client. These tools, the techniques of operant behavior modification, can be easily taught to the caretakers who can use them in applied settings now and in the future. The model asserts it will be self-perpetuating by way of positive reinforcement processes.

The difficulties with the re-education model center on the issue of generalization, which may be conceptualized as extending across three dimensions: time, settings, and behaviors. O'Leary and Kent (1973) have documented the widespread failure of behavior modification to produce results which generalize over time. Inseparable from this issue is the point that behaviors fail to generalize across settings. Wahler, Berland and Leske (1975) showed convincingly that behavior changes made in a highly regarded residential treatment facility for children did not generalize over time and setting. When the children left the residential facility, their behavior reverted (in 82% of the cases) to the presenting complaint behaviors which had gotten them sent into treatment originally. Furthermore, behavior technologists have concentrated, in their allegiance to the operant conditioning model, on single behaviors and their direct consequences or antecedents. A growing body of research, however, tends to contradict the notion that single responses operate without altering other behaviors. These "side effects" can be desirable or undesirable, but their distinguishing characteristic is the difficulty involved in their prediction. Wahler, Sperling, Thomas, Teeter and Luper (1970), Risley (1968), Sajwaj, Twardosz and Burke (1972), and Wahler and Nordquist (1973) all discovered unexpected changes in non-targeted behaviors when

contingency management was used on a single response. In Wahler (1975) and Kara (1975), it was found that some side effects could be predicted. The explanation, according to the operant paradigm, is that these behaviors ought to be under the control of some common stimulus, which would explain the covariation of these behaviors. However, a search for such stimulus control has proven fruitless.

The difficulties of the re-education model do not call for its wholesale rejection, but instead summon its expansion. Such a broadening of the model's focus would attempt to deal with the generalization problems posed by an operant based behavior technology while retaining many features of the model such as the use of caretakers as "therapists", the natural setting approach, and the use of operant techniques to produce initial behavior changes. The problems with the model center on its narrow scope, that is to say its predilection towards the measurement of only a few responses and their dyadic or two person settings. Wahler and Coe (1975) assert that the stumbling block of generalization may in part be due to the fact that while our intervention strategies may concentrate on dyadic interchanges, the sources of stimuli may indirectly form a network, known as a social system. The usual strategy for applied behavior analysis is

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Insert Figure 1 about here

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to concentrate on teacher-child or parent-child interactions. The Figure 1 diagram shows that other forces can directly or indirectly impinge on the child's behavior and that a focus on any single dyad may delete vital data. Behavior modification studies have shown that changes in teacher behavior can have effects on student behavior (e.g. Madsen, Becker and Thomas, 1968), that students can influence changes in teacher behavior (e.g. Sherman and Cormier, 1974), that students can affect each other's behavior (e.g. Solomon and Wahler, 1973), and that teacher reinforcement of a target child's behavior can have a vicarious reinforcement effect on peers (e.g. Kazdin, 1973). Looking at these studies as

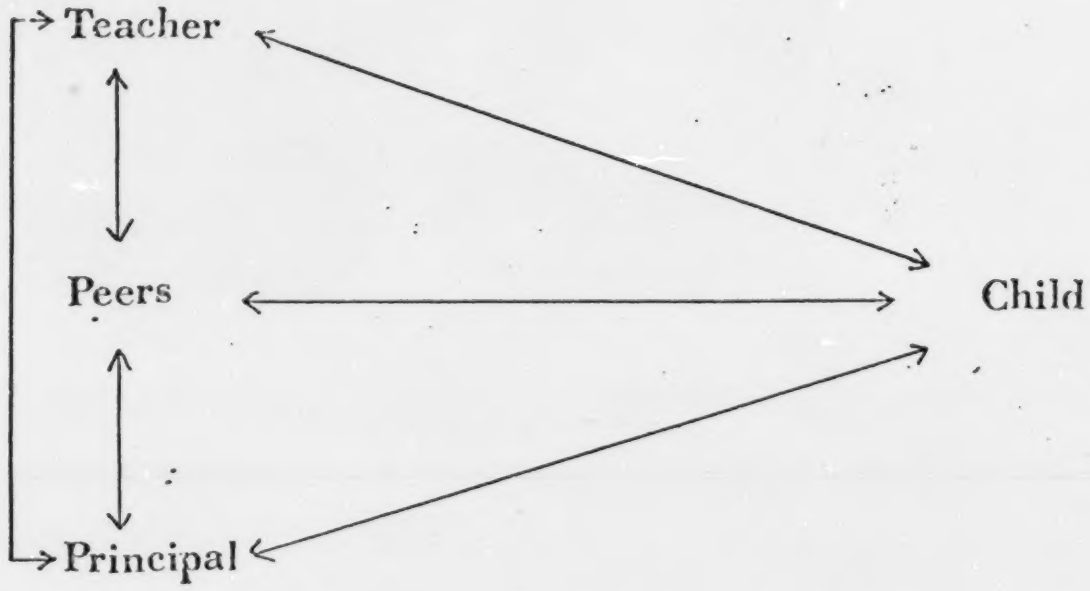

Figure 1. A schematic portrayal of stimulus contingencies likely to affect the behavior of a single child in a public school setting. Notice that some contingencies directly affect the child, while others serve an indirect function.

a group, it seems logical to assert that no perspective which accounts for a single pair of interacting variables (e.g. teacher-child) can explain the functioning of what is essentially a social system -- such as a classroom or a family. Our re-education model does not readily permit the grasping of such complex data. In its place we propose an expansion of the model.

The Social Systems Approach

As an alternative to re-education, we propose a model of behavior which appreciates a systems view of phenomena. This approach should not be confused with the discipline "systems analysis" (Huse, 1970), but should be seen as a heuristic tool for looking at behavioral data in a new way. The systems approach as we define it understands the world as comprised of systems and subsystems which function as wholes and must be understood as wholes. Borrowing a bit from the Gestalt psychologists, this systems model argues that the parts never explain the wholes and borrowing from Roger Barker (1968), the approach argues that behavior must be studied in its context to be understood.

Behavior appears determined by subsystems which always form the components of other systems. At the first level is the covarying system of behaviors within a child's repertoire of responses (sometimes known as a response class). At the next level is the interacting behavior system of the child's primary group, such as the family. At the third level, the family subsystem serves as a component of the community system. When portrayed in simple fashion these levels look something like Figure 2.

Insert Figure 2 about here

As can be seen, each level is a subsystem, which forms a component of other systems of increasing complexity. It is essential to note that in higher level systems,

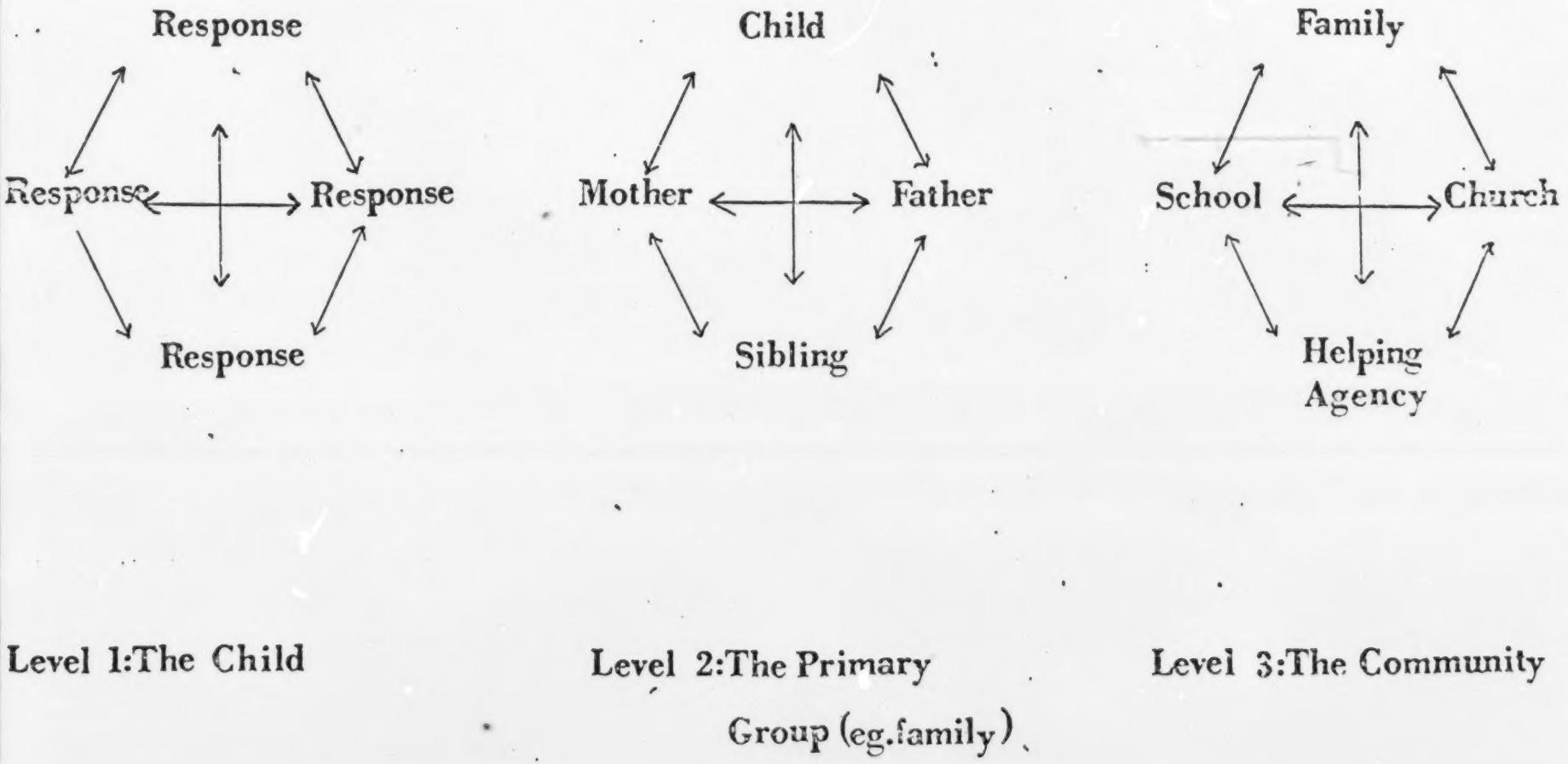

Figure 2. A schematic portrayal of interdependencies governing behavior at three levels. Level 1 considers the child as a system of covarying behaviors. Level 2 views the primary group (in this case the family) as a system of covarying people. Level 3 reaches the community level of system operation. Here, groups of people are seen as covarying units comprising a community.

whose components are themselves subsystems, the subsystems operate simultaneously. This staggering complexity only underscores a need to expand the re-education model of therapeutic behavior change. Let us now turn to a detailed examination of the multi-level systems approach to this endeavor.

Level 1: The Child as a Behavioral System

Reference has been made above to findings that changes in rates of target behaviors have impact on other behaviors in the child's repertoire. These "side effects" are manifested by correlated changes in other behaviors that have not been tied to changes in external controlling stimuli. These groups of covarying behaviors have been called "response classes" (Sajwaj etal, 1972; Wahler, 1975), and suggest limitations in operant explanations of human behavior.

The previously reviewed response class findings suggest a view of the child as a behavioral system, responding predictably (though not simply) to stimulus input, according to as yet unspecified principles. As such, the child's repertoire must be dealt with as a complex, interdependent network of behaviors. Tampering with one behavior would be expected to have impact on other behaviors in the system, and problem behaviors can therefore not be modified in isolation from the rest of the child's repertoire.

This systems model, then, describes interrelationships among the child's behavior in terms of correlations among them in their day to day occurrences. Aside from indicating the presence of a complex behavioral system, these correlations have direct clinical applications which will be discussed later. Implications of the model deserve mention now, however. One is the possibility of correlational or response class differences among children -- particularly between deviant and non-deviant children. One such difference has already been confirmed by several investigators. Delfini, Bernal and Rosen (1974), Lobitz and Johnson (1974), and Moore (1975) found a larger number of significant correlations among behaviors in deviant than nondeviant children. This has been in-

terpreted as greater predictability within the repertoires of deviant children than those of non-deviant children (Moore, 1975). Such a finding has implications for the possible detection of children in need of psychological help.

A second possibility is that specific correlational relationships could be held in common by troubled children. Wahler and Moore (1975) report indications of such common correlations for a sample of deviant children in home and school classroom settings. In essence, these investigators discovered that the children's serious problem behaviors could be predicted on the basis of their appropriate social behaviors. On days when these children were particularly gregarious, they were also likely to engage in deviant activities such as stealing, fighting, truancy, and property destruction. The possibility of changing such children's problem behaviors indirectly is suggested by these correlations.

Level 2. The Primary Group as a Behavioral System

Children do appear to locate themselves in a fairly common and limited set of environments. As Barker and Wright (1954) demonstrated, these environments -- such as the home, school classroom and playground, call forth different but predictable styles of behavior. The people making up these environments might well be referred to as the child's "primary" group: "primary" in the sense that most children seem to become members of these groups at various points in their lives. Response class phenomena are probably evident in similar form at this group level.

Berland (1976) extended individual response class findings to whole families as behavioral systems. A family response class is derived from the intercorrelations of daily behavior totals, within and among persons, for all family members. This requires that each family member's behavior be sampled each observation session, and then the behaviors are correlated across sessions. Response classes in the sample families included more than one behavior from a given individual, and behaviors from several different persons. As with the individual response classes, the family response classes included both deviant and non-deviant, and

social and nonsocial behaviors.

The family response classes were "well-knit" (Morgan, Simpson, Hanby and Hall-Craggs, 1976) in that there were numerous intercorrelations among the behaviors in a given response class. Response classes could be derived which included multiple problem behaviors from several different family members. This suggests a notion of the family as a complexly interdependent behavioral system. This interdependency is clearly not limited to behaviors intrinsic to social exchanges. Interrelationships among isolate behaviors, across family members, exist in families as groups. Family members affect one another's day to day output of social and nonsocial behaviors.

As with individual deviant children, deviant families were found to have significantly more intercorrelations than nondeviant families. This difference was not simply the result of more correlations within deviant individuals' repertoires than those of non-deviants. There were more correlations between deviant family members than between non-deviant family members, thus truly extending response class findings to families as behavioral systems. The correlational model can be said, then, to provide a means for describing individuals and families in comparable terms. It also provides a means for demonstrating the interdependent and contextual relationship among behaviors within an individual's repertoire, and among individuals' behaviors in the family setting. Assessment can be made of the impact of change in an individual's behavior on others around him or her. The context (supportive or destructive) of such a change can also be assessed -- and dealt with.

Level 3: The Community as a Behavioral System

While the primary group can be viewed as an immediate context for children, it is also apparent that the members of such groups interact with one another. This sort of group-group interchange constitutes another level of behavioral interdependency -- a level that any change agent must consider seriously. There

are little data to verify the correlational or systems model for higher level systems such as the community. As we noted, the model would view a larger system like the community as being comprised of interdependent behavioral units such as families, schools, public agencies, businesses, etc. Assessing the impact of these elements on one another need not pose an extraordinarily difficult task. Behavioral outputs of these units (toward one another and independent of one another) could be intercorrelated to describe relationships existing among them. This type of analysis is part of the authors' continuing work with the social systems model.

We are currently collecting data which may at least reflect community system operation and its impact on families and individuals, as suggested by the social systems model. These data stem from a notion we refer to as the "insularity hypothesis". Insular families show less "functionality" in their interactions. While there may be greater predictability among deviant family members' behaviors, their interactions with one another have little impact on the participants, and do not lead to alterations as a result of the exchange. Such families may also have contact with other elements in the community, but these contacts have less effect on the family members, individually or interactively, than do those for non-insular families. It is speculated that family insularity bolsters the development and maintenance of deviancy by eliminating self-correction in the family in response to input from within, and outside the family (see Hoffman, 1971).

Our development of the insularity hypothesis actually began some time ago through research by colleagues at the Oregon Research Institute (Patterson and Reid, 1970) and our own efforts (Wahler, 1969). The Patterson group marshalled data to show that deviant families appear to be "locked" into stylized manding interchanges between parent and child. As such, other forms of parent-child interchange (e.g. affection) are unlikely to be functional -- a speculation supported by Wahler (1969). Thus, deviant family operations were expected to be

more predictable than those of non-deviant families because the former are characterized by a more limited communication network. Put another way, the minimal social exchange options available to the deviant family "insulates" the members from one another.

The next step in developing the insularity hypothesis came from a series of treatment failures by the authors (Wahler and Moore, 1975). These authors discovered that families living in community areas marked by poverty, broken families and high crime incidence were particularly resistant to change. Repeated contacts between these families and other subsystems of the community (e.g. helping agency, school) had little sustained impact on the ways in which these families operated. Thus, at the community level, some families might be expected to display insularity in reference to their subsystem context. From a correlational viewpoint, the operations of such families should not interrelate with the operations of other subsystems in the community.

The data taken to help reflect family insularity in the community are daily records of the number and nature of parent contacts with people outside the immediate family. The nature of parent contacts include such factors as distance of the contact from home, relationship of the interaction associate to the parent, quality of the interaction (positive, negative, etc.), duration of the interaction, etc. If these data were correlated with family members' behaviors, the amount of impact that outside contacts were having on the family might be partially assessed. More correlation would imply less insularity. The kinds of impact outside contacts were having might also be assessed (1) by the type of behaviors correlating with the contact measure, and (2) by the direction (positive or negative) of the correlations.

The presence of such correlations and differences between deviant and non-deviant families, beyond verifying the insularity notion, would confirm the contextual effect of the community on family and individual behavior as suggested

by the social systems model. This would further verify the importance of looking at factors at various levels of behavioral systems when designing and implementing treatment strategies.

Practical Derivations of Subsystem Analysis

As indicated above, the social systems view in general, and the correlational model in particular have some direct clinical applications. To begin with, reliable behavior covariations across treatment conditions suggest the possibility of indirect modification procedures. These procedures would be particularly useful when the target response is not very amenable to immediate consequation. For instance, imagine a child whose referral problems include excessive approaches to his parents when he's home, and petty thievery from local stores. Petty thievery is an example of the low rate problems many parents have with oppositional children. Many of these problems occur when the child is beyond the parents' range of monitoring, making them very difficult to deal with. If this child's petty thievery rates correlated positively with his rates of approach to his parents, a contingency reducing parent approaches might reduce his rates of petty thievery. From another point of view, Wahler (1975) and Kara (1975) have shown that various "side effects" from treatment (desirable and undesirable) could be predicted from baseline correlations among behaviors. Wahler (1976) reported that additional contingency management procedures readily corrected undesirable "side effects". The important factor was the multiple behavior measurement and response class assessment to detect them in the first place.

The within-child behavior correlations found common to a sample of children (Wahler and Moore, 1975) have suggested their own new approach to indirect modification. Nonsocial toy play in the home and nonsocial schoolwork in school were found to be inversely related to low rate problem behaviors in their respective settings. These relationships are not considered to be just the result of mutual incompatibility of the behaviors[14] The sampling periods for the non-

social activities ("productive solitude") were quite different from those for the low rate problems. The rate and duration of periods of nonsocial toy play by deviant children have been increased in the homes with positive reinforcement contracts. In these contracts, the children are rewarded for producing continuous periods of isolate toy play for a required amount of time each day. This is an enjoyable procedure for the children and easy for parents to administer. Preliminary findings indicate that beside reductions in low rate problems, other unexpected but desirable changes have occurred. Parent-child interactions and parent attitudes toward the children have markedly improved in some previously intractable families and high rate problems have also shown declines. Even if these findings were not to be borne out in further research, the toy play contracts have turned out to be a useful means of training a population of families in contracting that found traditional contracts almost impossible to implement and maintain.

The family response class data suggest that indirect modification across family members might also be explored. Intervention with multiple deviant family members might be simplified if deviant behaviors covaried across them and indirect strategies were utilized. If target behaviors for two children were positively correlated, the parent might punish only one of these children, but more effectively, and change both. This is, of course, ultimately an empirical question. Furthermore, the presence of family and individual behavior patterns (in particular settings) suggested by the response class findings indicates the possibility of identifying family and individual patterns likely to lead to future, more severe problems. Such families might be picked up as referrals by social agencies, identified in terms of these patterns, and be offered the option of being put on some type of preventative follow-up program.

A final clinical strategy was suggested by the insularity hypothesis, which itself was the result of a broadened social systems orientation. If family members were insular (nonfunctional) in their intra- and extra-familial inter-

actions, effective feedback might be restored and deviancy decreased if insularity were reduced. By forming these people into weekly meeting groups, we hope to promote their positive interchange and thus increase the liklihood that they will reinforce one another outside the group meetings. If so, family insularity would be reduced and a means of sustaining therapeutic family change could be offered.

As the foregoing section has shown, there can be some practical benefits of a systems approach in applied behavior analysis. Large scale research programs with such an orientation might well offer new tools to the community helping agent. "Productive solitude" and "insularity" could mark the initial products of this model.

Technological Features of the Social Systems Model

Thus far we have limited our discussion of the social systems approach to a rather abstract presentation. We now intend to get down to the practical specifics of this orientation -- specifics of use to the research worker interested in pursuing the approach.

In essence, the defining feature of a social systems model is assessment. Concepts outlining stimulus networks require assessment or measurement techniques that encompass multiple rather than singular sets of data. Our concern with multiple measurement was deemed necessary for three reasons: (1) assessment validity can be evaluated through concurrent validation among measures; (2) a single measurement system is rarely capable of detecting all important aspects of child behavior interactions (for example, direct observational techniques are unlikely to detect low rate behaviors such as stealing or setting fires, nor can they adequately sample the feelings and attitudes of the caretakers); (3) it is often not feasible to set therapeutic contingencies directly for difficult to detect behaviors. Behavior modifiers attempt to deal with these

problems indirectly through the setting of contingencies for the accessible high rate behaviors. This response class model has been a central feature of our investigations. Multiple measurement systems allow the clearest empirical identification of these potential behavioral covariates.

Ecological Interview

The first stage in the implementation of any treatment and measurement procedure involves, of course, interviewing the principals involved. Foremost among the three main purposes of the ecological interview is the educational experience it provides for both parent and interviewer. As such, it involves the interviewer in the perceptual and ethnic biases of the caretaker and thus gives a better perspective of the behavior within the family. Initially, few caretakers are able to adequately describe their childrens' behavior, its consequences and immediate environmental context. Most report vague developmental factors, cite personality traits, or characterize their child with some nebulous behavioral description (e.g. "hyperactive"). Some rudiments of social learning theory are taught to the caretakers to facilitate communication between consultant and caretakers and to aid in the later implementation of intervention procedures.

Secondly, the interview permits the initial specification of reinforcement traps and their situational descriptions. This procedure involves the "mapping" of the child's behavior through the course of a typical day. This serves the additional purposes of specifying the best times for direct observations with a standardized coding system (Wahler, House and Stambaugh, 1976) and pinpointing those low rate problem behaviors not sampled by direct observations (e.g. stealing). These latter behaviors are typically monitored by daily parent report.

A third and often overlooked function is gathering contextual data for the target child, sibling, parents and community on actual living conditions which may have a profound impact on the success or failure of an intervention procedure. In particular, such contextual variables might influence the generalization of

changes produced in the target child over time, across settings and across behaviors.

Direct Observational Procedures

Conditions for an acceptable observation are generally set during the ecological interview. Common criteria for setting an observation time generally include: most family members should be present and not engaged in some distracting individual activity (e.g. T.V. watching, eating). There are of course a variety of environmental conditions which occur in any valid observation period which may result in significant change in the incidence of behavior detected by direct observation. Common factors include a parent leaving or entering the observational area, the number of children present, etc. These conditions are reported along with the targeted child's interactions as reported by the standard observational coding system. The standard observation codes (SOC, Wahler, House and Stambaugh, 1976) permit the recording of twenty child behavior categories, six social environment categories of adult and peer behavior, and the interval by interval coding of the visual presence of the mother or father. As can be seen in Table 1, a wide range of behaviors can be measured. These include social and non-social, deviant and non-deviant, active and passive sorts of behavior. Social event categories include non-aversive and aversive attention provided by adults and peers, and aversive and non-aversive instructions by adults.

Insert Table 1 about here

Each observer carries a portable tape player that announces by earphone consecutive 10 second observation intervals and alternating 5 second record intervals. Observers watch the child subject and his adult and child interaction associates for 10 seconds and then record in the next 5 seconds all categories that occurred in the preceding 10 seconds interval. Since observation sessions are restricted to half hour periods, a maximum of 120 units of a category occurrence can be

A. Target Child Behaviors

1. Compliance (C).[a] Any instance of compliance with an adult instruction (except those instructions forbidding some activity.)
2. Rule Violation (RV). Any instance of noncompliance with a permanent rule or temporary rule (see Nonaversive Adult Instruction--IA+).
3. Opposition (O). Any full 10-sec interval of noncompliance with an instruction.
4. Aversive Opposition (O-). Valence quality of a Rule Violation or Opposition that is also scored if an occurrence of either of these has an aversive quality (see Aversive Adult Instruction).
5. Complaint (CP). Any instance of whining, crying, or any verbal or nonverbal act of protest.
6. Self-Stimulation (S). Any rubbing of any body part against the body or some other surface at least three times during an interval. E.g., foot-tapping, finger drumming, scratching, etc.
7. Object Play (OP). Idle, or nonpurposive manipulation of an object (three of the same movements within an interval). E.g., rocking a chair, pencil tapping, etc.
8. Self-Talk (T). Any instance of recognizable language spoken by the child to him or herself.
9. Sustained Non-Interaction (NI). A full interval of no meaningful interaction with person or object.
10. Sustained School Work (SS). A full 10-sec of any school-related work.
11. Sustained Toy Play (ST). A full interval of appropriate play with some object, with or without other children. E.g., (a) running a car around on the rug, (b) pushing a stick in the dirt, (c) riding a bicycle, (d) reading a comic book, (e) playing with a doll, (f) pushing a pencil around on the table.
12. Sustained Work (SW). A full 10-sec of adult-approved work. E.g., cleaning his or her room, washing dishes, taking out the garbage.
13. Sustained Attending (SA). A full 10-sec of directing visual or auditory attention toward a single person or event.
14. Approach Child (AC). Any initiation of an interaction with another child during the observe interval by the target child. May be verbal or nonverbal.
15. Approach Adult (AA). Same as Approach Child, only to an adult.
16. Social Interaction Child (SIC). Social behavior by the target child (toward another child) that is either part of an interaction in progress when the interval began, or in response to initiation by another child. May be verbal or nonverbal.
17. Social Interaction Adult (SIA). The same as Social Interaction Child, only toward an adult.
18. Mand Child (MC). Any instance of the target child commanding or giving an instruction to another child.
19. Mand Adult (MA). Same as Mand Child, only towards an adult.
20. Slash (SL). Any target child behavior that is covered by none of the other categories.

Table 1. Brief Descriptions of Standardized Observational Codes (SOC) categories.[b]

B. Behaviors by Other People Toward the Target Child

21. Non-Aversive Adult Instruction (IA+ or IAP). Instructions to the target child by an adult. May command the child to engage in some activity, or may forbid the child from engaging in some activity. In the latter case, it is scored like a rule until the setting changes and called a "temporary rule."
22. Aversive Adult Instruction (IA- or IAM). Same as Non-Aversive Adult Instruction, only judged aversive in delivery due to (1) content (threat, ridicule), (2) tone (loud, angry), or (3) assertiveness (e.g., gesture, posture).
23. Non-Aversive Adult Social Attention (SA+ or SAP). Any non-instructional contact by an adult with the target child. May be verbal or nonverbal.
24. Aversive Adult Social Attention (SA- or SAM). Same as Non-Aversive Adult Social Attention, only aversive (see Aversive Adult Instruction).
25. Non-Aversive Child Social Attention (SC+ or SCP). Any contact by another child with the target child. May be instructional or not, and verbal or nonverbal.
26. Aversive Child Social Attention (SC- or SCM). Same as Non-Aversive Child Attention, only aversive (see Aversive Adult Instruction).
27. Visually Present (FP,MP,KP). These categories are scored respectively for the visual presence to the target child, for any instance of the father (FP), the mother (MP), or any other child (KP). "Visually present" means that the child could look up from his or her current position (swiveling 360°, if necessary) and see the other person. If the child would have to get up to look over or around an obstacle, the other person is not considered visually present.

Table 1 (continued)

[a]Note that these categories are not mutually exclusive. One behavior may be scored as several categories at the same time.

[b]See Wahler, House and Stambaugh (1976) for complete definitions, with examples.

scored. The observational sessions are generally scheduled 2 to 3 times per week in most school classrooms and homes.

Caretaker Reports: Episodes, attitudes and community interactions

Often families report behaviors not likely to be detected by SOC observations. These low rate behaviors are tracked and reported as frequencies, or in an occurrence-nonoccurrence manner (Did the child steal today? How many times did the child fight today?). These reports are prompted at the conclusion of a SOC observation by the SOC observer. The observer is also responsible for obtaining a caretaker attitude report on the target child after each SOC session. Wahler, Leske and Berland (in press) conceptualized these as summary reports at least partly determined by public events. Often caretakers can only vaguely specify these public events. The attitudes or summary reports are usually one aspect of the presenting complaints about most referred children. In these summary reports, caretakers may characterize the child as mean, distractible, or some other general descriptive term. The function of the attitude assessment is to specify those public events that covary with the attitudinal reports. If public referents for these reports can be specified, there is a greater hope for change by focusing on these public events. The caretaker attitude dimension is constructed from the earlier attitude statement. This dimension is presented to the caretaker at the end of each observation. That person is then asked to rate the behavior of the child as it occurred during the observational period. The dimension is a seven point scale with the most negative aspect (e.g. very mean) anchored by the 7 and the most positive aspect of the attitude (e.g. not at all mean) anchored by the 1. The chosen value reflects the caretaker's summary judgment of the child on that dimension during the SOC session.

The recording of the interactions of caretakers with members of their communities is designed to yield information that will reflect family insularity. These exchanges are qualified along four dimensions: (1) Functional character-

istics of the parents interaction associates (e.g. friend, helping agency, stranger); (2) Distance of interaction from home (e.g. in home, outside neighborhood); (3) Duration of interaction (e.g. minutes, hours); (4) Valence of interaction (positive, negative, neutral). This information is recorded for each outside interaction the caretaker has had that day. This information will be correlated with the behavioral measures taken in the home to assess insularity.

Data Processing

Integrating and analyzing the measures described above can quickly become a very cumbersome process when done by hand. A computer-based data management process was developed to ease this burden and to provide for nearly immediate utilization of data as well as easy application of statistical analyses. A crucial feature of this process was the design of computer scan forms that could be hand coded rapidly and machine scored. After the scan forms are machine scored, computer programs summarize the data and store them for application of packaged statistical analyses.

A flexible retrieval program which allows the recall of any single observation or aggregate of variables for inspection or future calculation is an important feature. The retrieval system is augmented enormously by the availability of a variety of statistical packages. These combined features allow the retrieval and analysis of almost limitless combinations of variables. The statistical procedures include reliability calculations of both trial and session data. This feature allows detailed reliability checks during all experimental conditions. The availability of ANOVA models makes practical the application of rather elegant procedures for the evaluation of behavioral measures (Cronbach, Gleser, Nana and Rajratnam, 1972). For example, Jones, Reid and Patterson (1974) have suggested a procedure for calculating the reliability of observational data that allows for the isolation of components of variance due to subjects, occasions, coders, and their interactions.

Overview

We have presented a methodological strategy reaching beyond the guidelines of reinforcement theory. As such, it is important to note that the strategy does not bear allegiance to theory. Social systems analysis carries no assumptions concerning why or how child and caretaker behaviors are interrelated. Rather, the analytic strategy argues for the broadest possible scope of measurement -- a scope constrained only by the usual psychometric requirements of reliability.

The measurement of multi-level systems will undoubtedly have future impact on the assumptions behind reinforcement theory. Already some products of such analyses have been of a type not readily sorted out or made understandable through the present assumptions (e.g. "side effects"). One might view systems analysis as an inductive means of adding to or altering these assumptions. It is our guess that continued use of this strategy will eventually yield some fruitful modifications of the reinforcement paradigm.

Finally, we think it important to note that social systems analysis can provide the clinical practicioner with new tools. As we outlined earlier, this expensive and cumbersome strategy has led to the discovery of some potentially useful intervention techniques. Generalization problems -- the thorn in applied behavior analysis -- might well be solved by a more complete understanding of the social context in which child problem behaviors are maintained.

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